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2014 Defense Health Information Technology Symposium

Concept Exploration: An Integrated Theater Mobile
Computing Platform for the Warfighter

July 30, 2014



"Medically Ready Force...Ready Medical Force"

DHA Vision



“A joint, integrated, premier system of health, supporting those who serve in the defense of our country.”



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Learning Objectives



- Understand the role & services of Pacific JITC and the Integrated Test & Evaluation Center (ITEC) in the MHS
- Describe the use of RFID and barcode technology in patient ID, movement and mass casualty situations in combat and humanitarian missions
- Identify the use cases for integrated data patient ID formats to mobile devices capable of accepting patient ID and initial care to more robust mobile medical care applications capable of recording first-responder and care en-route for injured patients
- Understand the concept of complete EHR capture of medical care delivered to the correctly identified patient using mobile technology
- Describe the integrated initial mobile capability that the UTSP brings to the MHS to rapidly supply electronic medical documentation and communication to a mission until the services can establish more robust mission processing capability.

Agenda



- Pacific JITC and ITEC overview
- MHS Across the Continuum of Care
- Warfighter Operations – TMIP-J
 - Current Operational Footprint
 - Current Deployment Readiness Systems / Initiatives
- Warfighter Mobile Computing Concept
 - POI > En-Route Care > Disposition to Role 3 facilities
 - RFID & Barcode technology for mass casualty
- United Theater Server Platform (UTSP) "Doc-in-a-Box"
 - Concept, Operational Architecture, TMIP Framework
- Questions, Evaluations and Conclusion

Pacific JITC Mission and Vision



- Pacific JITC’s mission is:

“To rapidly research, test and develop warfighter medical solutions and products, through pilots or prototypes that provide mission critical value and actionable information to the DoD, including the Services, Combatant Commanders, and the Department of Veterans Affairs (VA).”

- Pacific JITC’s vision is to support “Relevant Requirements” and deliver “Rapid Results”.

- Accomplish research through rapid prototyping, piloting, accelerated integration and proven interoperability to deliver speed to market for warfighter medical needs across the continuum of care.

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Pacific Joint Information Technology Center (Pacific JITC) Overview



- Supports DoD medical readiness requirements and information technology (IT) modernization needs through rapid prototyping and advanced concept development.

- The Pacific JITC offers the following advantages to the DoD medical community:
 - *Risk Reduction*: Early piloting allows the MHS to determine what IT solution is best, most cost effective and acceptable before a major acquisition is launched.

 - *Speed*: Capabilities are delivered more rapidly to the end user.

- Pacific JITC's Integrated Test and Evaluation Center (ITEC) is the first DoD/VA integrated lab where critical systems are virtualized.

Pacific JITC Integrated Test and Evaluation Center (ITEC)



State-of-the-art development environment to test interagency (DoD and VA) ideas and prototypes



- The ITEC hosts sandboxes on commercial networks or NIPRnet Zone B environment
- Closely resemble production environment configurations
- A virtual library of images emulates production systems to be used during development and test efforts
- All data is representative as de-identified or synthetic
- Sandboxes support the co-location of customer equipment, variable communications environments, etc.
- All sandboxes provide secure remote access (VPN) to sandbox environments for remote development, management, and testing
- All sandboxes are setup to maximize probability of successful transition to a program office or partner agency

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Innovation Ecosystem at Pacific JITC



- Set of evolving services, infrastructure, tooling, and processes that accelerate the overall innovation life cycle process as well as reduce the complexity of transitioning innovations to production/operational portfolios.
 - ❑ Secure access to development services, all wrapped within a powerful and automated development/operations pipeline
 - ❑ A suite of value-added services that facilitate access to data sources, authentication services, etc.
 - ❑ Access to libraries of project templates, application stacks, and support for migration to other environments
- The Innovation Ecosystem will be initially deployed in two environments to support two broad user bases:
 - ❑ Advanced Concept & Engineering (ACE) Environment –provides innovators with secure access to Innovation Ecosystem services in order to build prototypes and proofs of concept
 - ❑ Secure Development and Test Environment – provides an initial, secure, DoD-facing capability for trusted DoD users to gain access to the Ecosystem services to develop and test production-facing capabilities

The MHS Across the Continuum



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Current Theater Depth & Breath of Care



TMIP-J (As of 20 Nov 2013)

- 6 Theater Hospitals, 451 Forward Resuscitative sites
- 127 U.S. Navy Ships, 23 Subs
- 13.80 million orders of ancillary services (laboratory, radiology, pharmacy)
- 6.83 million outpatient encounters captured



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DHCS Programs, Projects, and Initiatives – 25 May 2014



(Source: HIT OFF SITE DHCS Brief)

EHR Core PMO:

- AHLTA 3.3 Sustainment
 - AHLTA Integration
 - AHLTA Web Print
 - Clinical Data Repository (CDR) Stabilization
- AHLTA Local Cache System Technology Refresh and Virtualization
- AHLTA baseline 3.3.8 including International Classification of Diseases (ICD)-10
- Composite Health Care System (CHCS)
 - CoPath
 - Defense Finance and Accounting Service (DFAS) Interface
 - ePrescription
- Essentris® Inpatient System
- International Classification of Diseases (ICD) and Current Procedural Terminology (CPT) Code Updates

Deployment & Readiness Systems PMO:

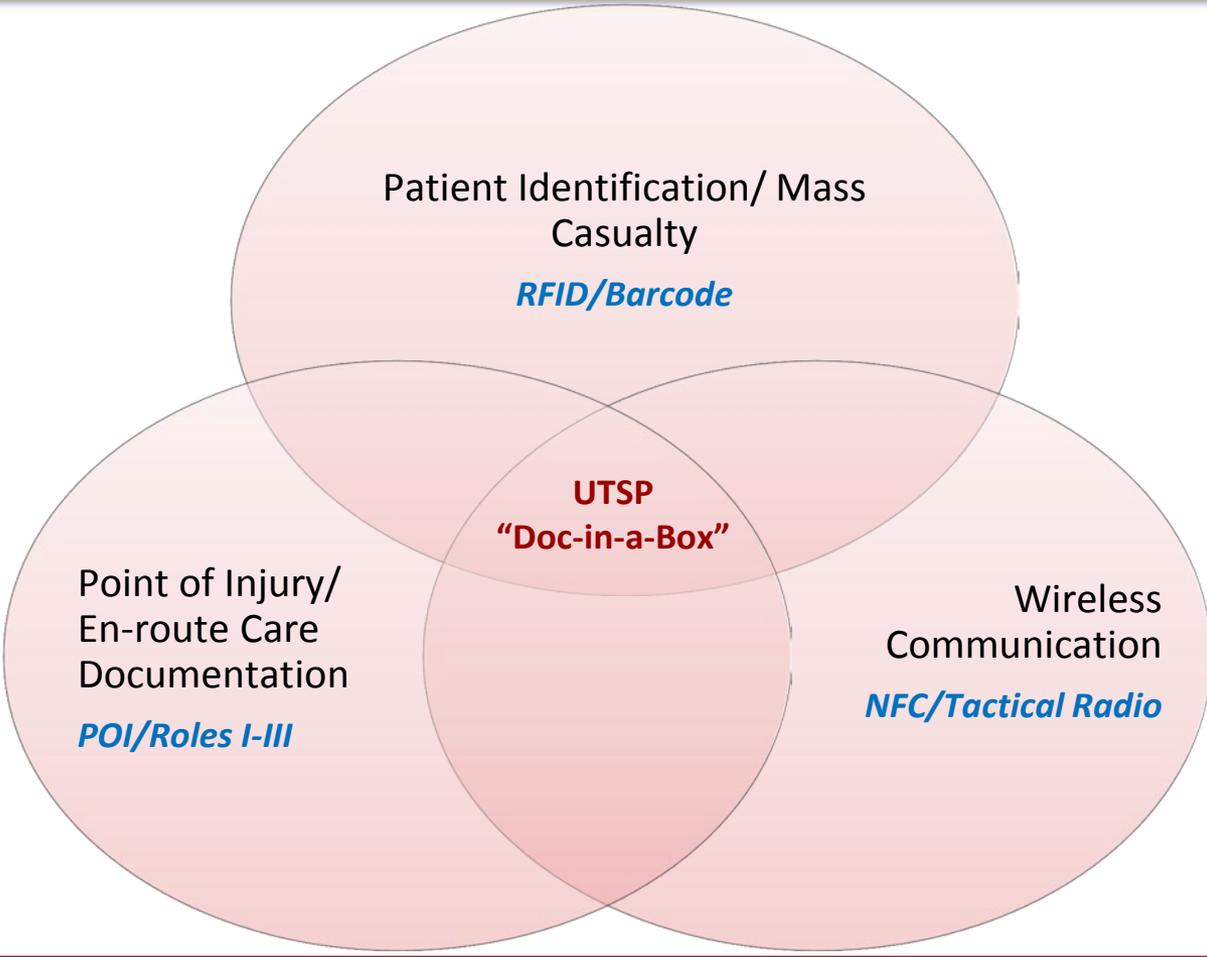
TMIP-J Increment 2 consists of:

- TMIP Framework
 - Theater Integration
 - Theater Medical Data Integration
 - Theater Single Sign-On
- AHLTA-Mobile
- AHLTA-Theater
- TMIP CHCS Cache (TC2)
- Maritime Medical Module (MMM)/Shipboard Automated Medical System (SAMS) Support
- Deployed Tele-Radiological System (DTRS)/Theater Imaging Repository
- Medical Situational Awareness in Theater (MSAT)/Joint Medical Workstation (JMeWS)
- Theater Medical Data Store (TMDS)
- **Other D&RS Projects and Initiatives are:**
- Enterprise Blood Management System (EBMS)/(LEGACY) Defense Blood Standard System (DBSS)
- JTF-Bravo
- White House Medical Unit

Data Sharing PMO:

- HAIMS (Health Artifact and Image Management Solution) Integration
- VBA Service Treatment Record (STR) Sharing Interface (VSSI)
- ICP - Interagency Comprehensive Plan for Care Coordination Support (ICPCCS)
- Integrated Health Registry Framework
 - DVEIVR

Integrated Mobile Platform Concept



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Warfighter Mobile Computing: Continuity of Care



Point of Injury



Scan tag to initiate encounter and record casualty time/location



Level 1



Record treatment information and write to tag



En Route Care



Record evac time/location. Add en route care note as needed



Level 2/ Level 3



AHLTA-T/TC2

Point of injury information available upon arrival. Bedside patient identity verification.



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En-Route Care – Mobile Concept and Hand-off



Medevac Request and Tracking/ First Responder Care

Ability for mobile device to interface with RFID technology for reading/writing of patient data, as well as transfer of patient data to en-route care via NFC transfer.



Interfaces

USTRANSCOM/TRAC2ES via radio comm

En Route Care Data Recording

Ability for mobile device to interface (via direct connect or wirelessly) with physiological sensors/monitors on-board the MedEvac vehicle (e.g. Blood Pressure, SpO2) and view Medical Situational Awareness Location data.



Interfaces

AHLTA-T via sync server

Physiological Monitors

Mobile Trauma Care for Fixed Facilities

Ability for mobile device to interface with MHS source systems such as AHLTA-T, TMDS, and MSAT for aggregation of data on mobile device, providing enhanced medical situational awareness, and initiate strategic evacuation.



Interfaces

AHLTA-T via sync server

Theater Medical Data Store (TMDS)
 Medical Situational Awareness In-Theater (MSAT)
 Clinical Data Repository (CDR)
 Veterans Affairs via BHIE

Physiological Monitors

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Theater Mobile Computing Concept - Essential Features



- **Device neutral** - Ability to be device agnostic
- **Vendor neutral** - Is independent upon a particular platform or operating system vendor.
- **Systems integration** - Can store and forward collected medical data to legacy and proposed MHS systems.
- **Appropriate form factor**: Is portable/mobile.
- **Hands-free**: Allows for voice recognition.
- **Wireless medical data forwarding**: NFC and Bluetooth may be used in low and no communication environments.
- **Rugged**: Ability to protect the device from environmental factors and bio-contaminant and work in harsh (wet/hot/cold) environments and be cleaned or disinfected.
- **Efficient**: Easy to understand and use, standardized input forms. Programming to minimize use of the processor to save battery power.
- **Secure**: Applications are secure and follow HIPAA and other operational constraints as required.

Concept Core Capabilities - Barcode & Radio Frequency Identification (RFID)

RFID powered by a bring-your-own device mobile computing platform – most important data travels securely with the patient



Technologies Applied:

- Radio Frequency Identification (RFID)
 - Near Field Communications (NFC)
- Barcode Scanning (1D and 2D)

Key Advantages:

- Point of Injury/ Enroute Care data travels securely with the patient
- Next-level providers accurately identify patients and access treatment history on demand
- Reduction in medical errors due to patient misidentification
- Patient tracking from point-of-injury to definitive care plan to include return to duty/ release from active duty.

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A New Approach for Mass Casualty Patient ID

Near Field Communication (NFC)

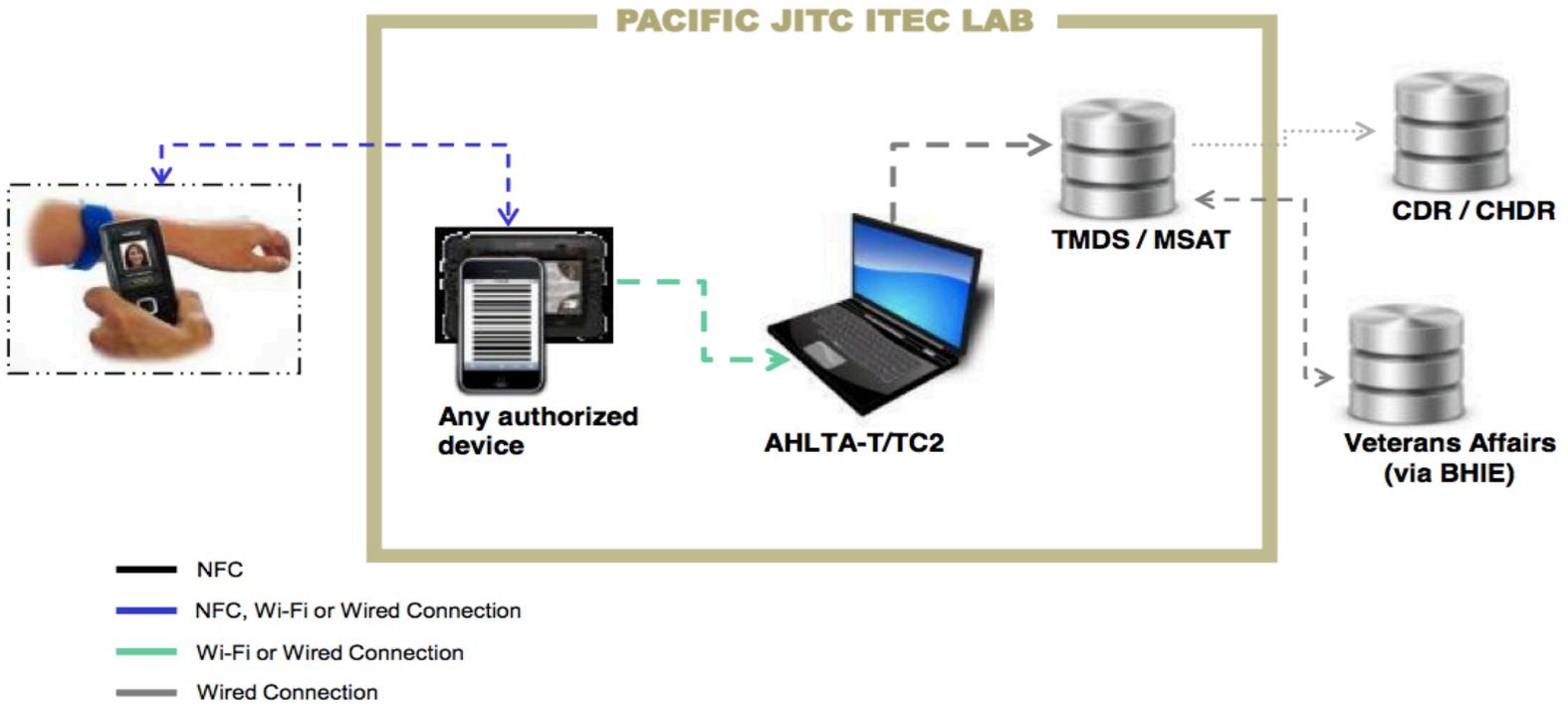
- Works within 1-2 centimeters between device/tag or device/device or tag to laptop/desktop via USB or Bluetooth
- Data can be encrypted; size of data storage limited to device selected
- Works with multiple OS



Integration of the Mobile Patient ID Concept with the EHR

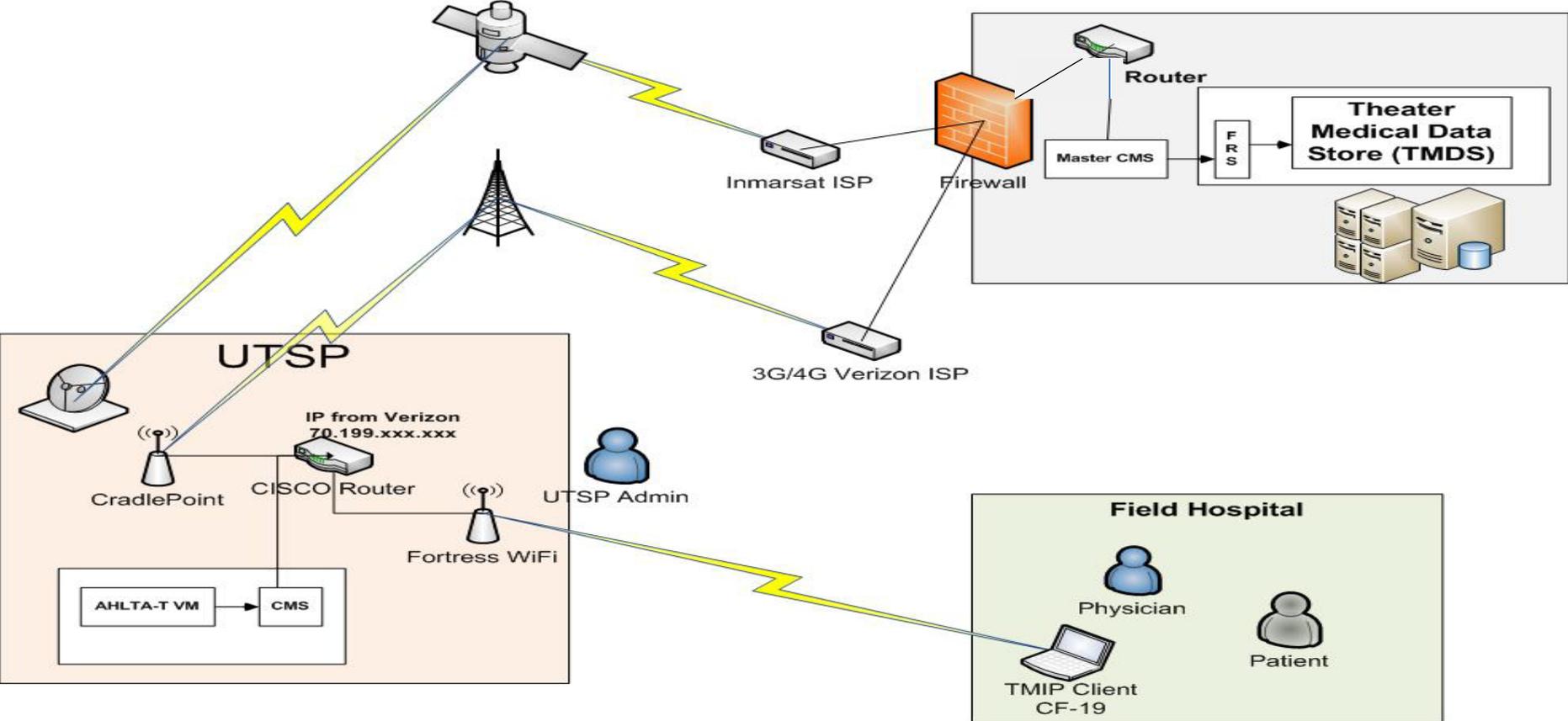


Using Pacific JITC ITEC Lab – provides sandbox of MHS operational platforms to simulate and evaluate integration of RFID proof of concept with longitudinal EHR systems



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UTSP Operational Architecture – “DOC-in-a-box”



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What is the Unified Theater Server Platform (UTSP)?



- A ruggedized server (for field locatable services) and next generation communications kit for all centralized service delivery into the field
- Provides the ability to integrate multiple server based components with virtualization for more utility per grid, better power efficiency, improved redundancy and better scaling

UTSP - Technical Goals

- Power efficiency - System redundancy - Scalability
- Integrated suite of networking (switches, routers, gateway, etc.)
- Communications and access components (wired, satellite, 3G/4G, Worldwide)
- Interoperability for:
 - Integrated security components
 - Remote and onsite monitoring
 - Integrated messaging
 - Health information operability
 - Faster Input/Output (I/O) approach between components and subcomponents
- Networking and storage
 - Flashed-based storage (where applicable) for faster data retrieval support dynamic configuration, which will be managed from a common utility and delivered in an “all-in-one” approach—with a Theater Medical Information Protocol(TMIP) in one or two boxes for storage.
- The portable, ruggedized, minimal footprint

USTP - Portable “Doc-in-a-Box”

- Server
- Transit cases
- Power
- Networking
- Communications
- Wireless



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Questions?



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Please complete your evaluations.

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